Press release

Forests and soils may speed up global warming

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Global warming may occur faster and simply planting forests may be less effective in slowing the warming than previously expected. These are the conclusions of Met Office experts studying the effects of vegetation, soils and oceans on climate change. Their findings are published in two papers in this week's edition of Nature.

In one paper, a research team from the Met Office's Hadley Centre for Climate Prediction and Research, in collaboration with Southampton Oceanography Centre, describe the world's first computer model of climate which includes the effect of climate-induced changes in vegetation and the carbon cycle. Using this model, the team led by Dr Peter Cox predict that global warming is likely to cause the world's soils to emit more carbon dioxide to the atmosphere, leading to further warming of the climate.

They also found that climate change could threaten the viability of the Amazonian rain forest, which would also release carbon dioxide and contribute to faster global warming. The model predicts a rise in average global land temperatures of 6°C (or 11°F) from 2000 to 2100, which is 2.0°C (or 4°F) higher than predictions made before these effects were included.

Dr Cox said: "Our initial results suggest that vegetation and soils, which currently absorb about a quarter of human-made carbon dioxide emissions, could accelerate future climate change by releasing carbon to the atmosphere as the planet warms. This potentially large climate feedback needs to be investigated further."

The second paper shows that planting new forests will not slow global warming as much as expected. The Kyoto Protocol allows countries to plant forests in order to offset some of their CO2 emissions from burning fossil fuels. However, forests are generally darker than the underlying terrain, and hence absorb more of the sun's heat. This is particularly true in snowy conditions when grass and soil are covered by snow but trees remain exposed. The extra absorption of sunlight causes the world's northern forests to have a warming effect, which would offset part of the cooling effect of CO2 uptake. In some areas of Canada and Siberia, the paper suggests this warming effect is actually greater than the relative cooling afforded by CO2 uptake. Planting forests in these areas would therefore increase warming rather than decrease it as intended.

The author Dr Richard Betts said: "Natural forests are key for maintaining biodiversity and rainfall patterns, but in colder regions, growing new forests may not be as useful as expected for reducing climate warming. In some areas it could even be counterproductive".

The conclusions of both papers will inform negotiations at the CoP6 climate change political conference, to be held in the The Hague over the next two weeks.

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